

PTO/SB/DBA (08-03)

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Substitute for form 1449/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Complete if Known

Application Number	09/682 363
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Filing Date	8/24/2001
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First Named Inventor	Anthony C. Zuppers
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Art Unit	1753
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Examiner Name	Alan D. Diamond
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Attorney Docket Number	22122878-6
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U. S. PATENT DOCUMENTS

Examiner Initials*	Cite No.	Document Number	Publication Date	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code ² (700-00)	MM-DD-YYYY		
FD	25	US- 20020070632	06-2002	Zuppero et al.	/
FD	26	US- 4651324	03-1987	Prain et al.	//
FD	27	US- 5337329	08-1994	Foster, Jack	//
FD	28	US- 4756000	07-1988	Macken, John A.	//
FD	29	US- 5999547	12-1999	Schneider et al.	//
FD	30	US- 5048042	09-1991	Moser et al.	//
FD	31	US- 6268560	07-2001	Zueppero et al.	//
FD	32	US- 5587827	12-1996	Hakimi et al.	//
FD	33	US- 6114620	09-2000	Zuppero et al.	//
FD	34	US- 4012301	03-1977	Rich et al.	//
FD	35	US- 5470395	11-1995	Yater et al.	//
	36	US-			/
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INFORMATION DISCLOSURE CITATION IN AN APPLICATION <i>(Use several sheets if necessary)</i>	Attorney/Doct. Number 22122878-6	Application Number 09/682,363
	Applicants Anthony C. Zuppero et al.	
	Filing Date 8/24/2001	Group Art Unit 1753

U.S. PATENT DOCUMENTS

EXAMINER INITIAL	DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE

FOREIGN PATENT DOCUMENTS

	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION	
						YES	NO

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, etc.)

ADD	"Electron-hole pair creation by reactions at metal surfaces", downloaded from www.aps.org/meet/CENT99/BAPS/abs?S6980001.html American Physical Society Centennial Meeting Program, Atlanta, GA. 20-26 March 1999
ADD	"Electron-Hole Pair Creation at Ag and Cu Surfaces by Adsorption of Atomic Hydrogen and Deuterium", Physical Review Letters, Volume 82, Number 2. 11 January 1999
EXAMINER: <i>add</i>	DATE CONSIDERED: <i>11/18/05</i>
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Substitute for form 1449/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use as many sheets as necessary)	Complete if Known	
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	First Named Inventor	Anthony C. Zuppero
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	Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-6	

OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS			
Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	Y ²
ADD	2	HARRISON, P. et al., The Carrier Dynamics of Far-Infrared Intersubband Lasers and Tunable Emitters, Institute of Microwaves and Photonics, University of Leeds, U.K., pp. 1-64 (Date Unknown)	-
ADD	3	WEBER, et al., to X2 Electron Transfer Times in Type-II GaAs/AlAs Superlattices Due to Emission of Confined and Interface Phonons, Superlattices and Microstructures, Vol. 23, No. 2 (1998).	-
ADD	4	FANN, W.S. et al., Electron Thermalization in Gold, Physical Review B, Brief Reports, Vol. 46, No. 20, (1992)	-
ADD	5	Ultrafast Surface Dynamics Group, Time-Resolved Two-Photon Photoemission (TR-2PPE), http://www.llp.physik.uni-essen.de/aeschlimann/2y_photo.htm (Date Unknown)	-
ADD	6	LEWIS et al., Vibrational Dynamics of Molecular Overlayers on Metal Surfaces, Dept. of Chemistry, University of Pennsylvania, http://lorax.chem.upenn.edu/molisurf/cucotalk/html . (Date Unknown)	-
ADD	7	RETTNER et al., Dynamics of the Chemisorption of O ₂ on Pt(111): Dissociation via Direct Population of a Molecularly Chemisorbed Precursor at High Incidence Kinetic Energy, The Journal of Chemical Physics, Vol. 94, Issue 2 (1991)	-
ADD	8	FRIEDMAN et al., SiGe/Si THz Laser Based on Transitions Between Inverted Mass Light-Hole and Heavy Hole Standards, Applied Physics Letters, Vol. 78, No. 4 (2001)	-
ADD	9	HARRISON et al., Population -Inversion and Gain Estimates for a Semiconductor TASER (Date Unknown).	-
ADD	10	HARRISON et al., Theoretical Studies of Subband Carrier Lifetimes in an Optically Pumped Three-Level Terahertz Laser, Superlattices and Microstructures, Vol. 23, No. 2 (1998)	-
ADD	11	HARRISON et al., Room Temperature Population Inversion in SiGe TASER Designs, IMP, School of Electronic and Electrical Engineering, The University of Leeds (Date Unknown).	-
ADD	12	SUN et al., Phonon-Pumped Terahertz Gain in n-Type GaAs/AlGaAs Superlattices, Applied Physics Letters, Vol. 7; No.22 (2001)	-

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Substitute for form 1449/PTO		Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use as many sheets as necessary)		Application Number	09/682,363
		Filing Date	8/24/2001
		First Named Inventor	Anthony C. Zuppero
		Art Unit	1753
		Examiner Name	Alan D. Diamond
Sheet <u>1</u> of <u>1</u>	Attorney Docket Number	22122878-6	

OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS			
Examiner Initials ¹	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	T ²
AD	13	ALTUKHOV et al., Towards Si1-xGeX Quantum-Well Resonant-State Terahertz Laser, Applied Physics Letters, Vol. 79, No. 24 (2001)	
AD	14	SUN et al., Intersubband Lasing Lifetimes of SiGe/Si and GaAs/AlGaAs Multiple Quantum Well Structures, Applied Physics Letters, Vol. 66, No. 25 (1995)	
AD	15	SUN et al., Phonon Pumped SiGe/Si Interminiband Terahertz Laser (Date Unknown).	
AD	16	SOREF et al., Terahertz Gain in a SiGe/Si Quantum Staircase Utilizing the Heavy-Hole Inverted Effective Mass, Applied Physics Letters, Vol. 79, No. 22 (2001)	
AD	17	AESCHLIMANN et al., Competing Nonradiative Channels for Hot Electron-Induced Surface Photochemistry, Chemical Physics 202, 127-141 (1996)	
AD	18	AUERBACH, Daniel J., Hitting the Surface-Softly, Science, Vol. 294, pp. 2488-2489 (2001)	
AD	19	BADESCU et al., Energetics and Vibrational States for Hydrogen on Pt(111), Physical Review Letters, Vol. 88, No. 13 (2002)	
AD	20	BALANDIN et al., Effect of Phonon Confinement on the Thermoelectric Figure of Merit of Quantum Wells, Journal of Applied Physics, Vol. 84, No. 11 (1998)	
AD	21	BARTELS et al., Coherent Zone-Folded Longitudinal Acoustic Phonons in Semiconductor Superlattices: Excitation and Detection, Physical Review Letters, Vol. 82, No. 5 (1999)	
AD	22	BAUMBERG et al., Ultrafast Acoustic Phonon Ballistics in Semiconductor Heterostructures, Physical Review Letters, Vol. 78, No. 17 (1997)	
AD	23	BEDURFTIG et al., Vibrational and Structural Properties of OH Adsorbed on Pt(111), Journal of Chemical Physics, Vol. 111, No. 24 (1999)	

Examiner Signature	<i>Alan D. Diamond</i>	Date Considered	1/18/05
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OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS

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AD	24	VALDEN et al., Onset of Catalytic Activity of Gold Clusters on Titania with the Appearance of Nonmetallic Properties, Science, Vol. 281 (1998)	—
AD	25	BONDZIE et al., Oxygen Adsorption on Well-Defined Gold Particles on TiO ₂ (110), J. Vac. Sci. Technol. A17(4) (1999)	—
AD	26	BEZANT et al., Intersubband Relaxation Lifetimes in p-GaAs/AlGaAs Quantum Wells Below the LO-Phonon Energy Measured in a Free Electron Laser Experiment, Semicond. Sci. Technol. 14 (1999)	—
AD	27	BRAKO et al., Interaction of CO Molecules Adsorbed on Metal Surfaces, Vacuum 61,89-93 (2001)	—
AD	28	BURGI et al., Confinement of Surface State Electrons in Fabry-Perot Resonators, Physical Review Letters, Vol. 81, No. 24 (1998)	—
AD	29	BURGI et al., Probing Hot-Electron Dynamics at Surfaces with a Cold Scanning Tunneling Microscope, Physical Review Letters, Vol. 82, No. 22 (1999)	—
AD	30	CHANG, Y.M., Interaction of Electron and Hole Plasma with Coherent Longitudinal Optical Phonons in GaAs, Applied Physics Letter, Vol. 80, No. 14 (2002)	—
AD	31	CHANG et al., Observation of Coherent Surface Optical Phonon Oscillations by Time-Resolved Surface Second-Harmonic Generation, Physical Review Letters, Vol. 78, No. 24 (1997)	—
AD	32	CHANG et al., Coherent Phonon Spectroscopy of GaAs Surfaces Using Time-Resolved Second-Harmonic Generation, Chemical Physics 251, 283-308 (2000)	—
AD	33	CHANG et al. Observation of Local-Interfacial Optical Phonons at Buried Interfaces Using Time-Resolved Second Harmonic Generation, Physical Review B, Vol. 59, No. 19 (1999)	—
AD	34	CHEN et al., Stimulate-Emission-Induced Enhancement of the Decay Rate of Longitudinal Optical Phonons in III-V Semiconductors; Applied Physics Letters, Vol. 80, No. 16 (2002)	—

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AD	35	CORCELLI et al., Vibrational Energy Pooling in CO on NaCl(100): Methods, Journal of Chemical Physics, Vol. 116, No. 18 (2002)	
AD	36	FIERZ et al., Time-Resolved 2-Photon Photoionization on Metallic Nanoparticles, Appl. Phys. B 68 (1999); http://www.ilp.physik.uni-essen.de/aeschlimann/abstract.htm#6	
AD	37	BEZANT et al., Intersubband Relaxation Lifetimes in p-GaAs/AlGaAs Quantum Wells Below the LO-Phonon Energy Measured in a Free Electron Laser Experiment, Semicond. Sci. Technol., 14 No. 8 (1999)	
AD	38	BONDZIE et al., Oxygen Adsorption on Well-Defined Gold Particles on TiO ₂ (110), Journal of Vacuum Science & Technology A: Vacuum, Surfaces and Films, Vol. 17, Issue 4, pp. 4747-4720 (1999)	
AD	39	HARRISON et al., Maximising the Population Inversion, by Optimizing the Depopulation Rate, in Far-Infrared Quantum Cascade Lasers (2001)	
AD	40	HARRISON et al., The Carrier Dynamics of Terahertz Intersubband Lasers, Some Publishing Company (1999)	
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AD	43	CHIANG, T.C., Photoemission Studies of Quantum Well States in Thin Films, Surface Science Reports 39, pp. 181-235 (2000)	
AD	44	DEBERNARDI et al., Anharmonic Phonon Lifetimes in Semiconductors from Density-Functional Perturbation Theory, Physical Review Letters, Vol. 75, No. 9 (1995)	
AD	45	DAVIS et al., Kinetics and Dynamics of the Dissociative Chemisorption of Oxygen on Ir(111), J. Chem. Phys. 109 (3) (1997)	

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Sheet ☐ of ☐**OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS**

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ADD	46	CHOI et al., Ultrafast Carrier Dynamics in a Highly Excited GaN Epilayer, Physical Review B., Vol. 63, 115315 (2001)	
ADD	47	DIEKHONER et al., Parallel Pathways in Methanol Decomposition on Pt(111), Surface Science 409, pp. 384-391 (1998)	
ADD	48	DEMIDENKO et al., Piezoelectrically Active Acoustic Waves Confined in a Quantum Well and Their Amplification by electron Drift, Semiconductor Physics, Quantum Electronics & Optoelectronics, Vol. 3, No. 4, pp. 427-431 (2000)	
ADD	49	de PAULA et al., to X2 Electron Transfer Times in Type-II Superlattices Due to Emission of Confined Phonons, Appl. Phys. Lett. 65 (10) (1994)	
ADD	50	de PAULA et al., Carrier Capture via Confined Phonons in GaAs-AlGaAs Multiple Quantum Wells, Second. Sci. Technol. 9, pp. 730-732 (1994)	
ADD	51	DEMIDENKO et al., Amplification of Localized Acoustic Waves by the Electron Drift in a Quantum Well, Semiconductor Physics, Quantum Electronics & Optoelectronics, Vol. 2, No. 1, pp. 11-24 (1999)	
ADD	52	DEMIDENKO et al., Generation of Coherent Confined Acoustic Phonons by Drifting Electrons in Quantum Wire, Semiconductor Physics, Quantum Electronics & Optoelectronics, Vol. 3, No. 4, pp. 432-437 (2000)	
ADD	53	DENZLER et al., Surface Femtochemistry: Ultrafast Reaction Dynamics Driven by Hot Electron Mediated Reaction Pathways, World Scientific (2001)	
ADD	54	FATTI et al., Temperature-Dependent Electron-lattice Thermalization in GaAs, Physical Review B, Vol. 59, No. 7 (1999)	
ADD	55	ANASTASSAKIS et al., The Physics of Semiconductors, Vol. 2, World Scientific (1990)	
ADD	56	de PAULA et al., Carrier Capture Processes in Semiconductor Superlattices due to Emission of confined Phonons, J. Appl. Phys. 77 (12) (1995)	

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AD	57	ENGSTROM et al., Comparing the Vibrational Properties of Low-Energy Modes of a Molecular and an Atomic Adsorbate: CO and O on Pt(111), Journal of Chemical Physics, Vol. 112, No. 4 (2000)	✓
AD	58	GLAVIN et al., Generation of High-Frequency Coherent Acoustic Phonons in a Weakly Coupled Superlattice, Applied Physics Letters, Vol. 74, No. 23 (1999)	✓
AD	59	FRIEDMAN, SiGe/Si THz Laser Based on Transitions Between Inverted Mass Light-Hole and Heavy-Hole Subbands, Applied Physics Letters, Vol. 78, No. 4 (2001)	✓
AD	60	ERMOSHIN et al., Vibrational Energy Relaxation of Adsorbate Vibrations: A theoretical Study of the H/Si(111) System, J. Chem. Phys. 105 (20) (1996).	✓
AD	61	GLAVIN et al., Acoustic Phonon Generation in A Superlattice Under the Hopping Perpendicular Transport, United Nations Educational Scientific and Cultural Organization and International Atomic Energy Agency (1998)	✓
AD	62	GERGEN et al., Chemically Induced Electronic Excitations at Metal Surfaces, Science, Vol. 294 (2001).	✓
AD	63	HAGSTON et al., Simplified Treatment of Scattering Processes in Quantum Well Structures, Journal of Applied Physics, Vol. 90, No. 3 (2001).	✓
AD	64	HARRISON et al., Room Temperature Population Inversion in SiGe Taser designs (Date Unknown).	✓
AD	65	HARRISON et al., The Carrier Dynamics of Terahertz Intersubband Lasers, Some Publishing Company (1999)	✓
AD	66	HARRISON et al., Population-Inversion and Gain Estimates for a Semiconductor Taser (Date Unknown).	✓
AD	67	HARRISON et al., Theoretical studies of Subband Carrier Lifetimes in an Optically Pumped Three-Level Terahertz Laser, Superlattices and Microstructures, Vol. 23, No. 2 (1998)	✓

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use as many sheets as necessary)		Application Number	09/682,363	
		Filing Date	8/24/2001	
		First Named Inventor	Anthony C. Zuppero	
		Art Unit	1753	
		Examiner Name	Alan D. Diamond	
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ADD	68	HARRISON et al., The Carrier Dynamics o Far-Infrared Intersubband Lasers and Tunable Emitters, www.ee.leeds.ac.uk/homes/ph/ (Date Unknown)	
ADD	69	HESS et al., Hot Carrier Relaxation by Extreme Electron-LO Phonon Scattering in GaN (Date Unknown)	
ADD	70	HOHLFELD et al., Electron and Lattice Dynamics Following Optical Excitation of Metals, Chemical Physics 251, pp. 237-258 (2000)	
ADD	71	HUANG et al., Vibrational Promotion of Electron Transfer, Science, Vol. 290 (2000)	
ADD	72	KAWAKAMI et al., Quantum-well States in Copper Thin Films, Nature, Vol. 398 (1999)	
ADD	73	KOHLER et al., Enhanced Electron-Phonon Coupling at the Mo and W (110) Surfaces Induced by Adsorbed Hydrogen, mrl-th/9510004 (1995)	
ADD	74	LEWIS et al., Continuum Elastic Theory of Adsorbate Vibrational Relaxation, J. Chem. Phys. 108 (3) (1998)	
ADD	75	LEWIS et al., Controlling Adsorbate Bivibrational Lifetimes Using Superlattices, Physical Review B, Vol. 63, 085402 (2001)	
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ADD	78	LEWIS et al, Substrate-Adsorbate Coupling in Co-Adsorbed Copper, Physical Review Letters, Vol. 77, No. 26 (1996)	

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ADD	80	LUGLI et al., Interaction of Electrons with Interface Phonons in GaAs/AlAs and GaAs/AlGaAs Heterostructures, Semicond. Sci. Technol. 7 (1992)	-
ADD	81	NIENHAUS et al., Electron-Hole Pair Creation at Ag and Cu Surfaces by Adsorption of Atomic Hydrogen and Deuterium, Physical Review Letters, Vol. 82, No. 2 (1999)	-
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ADD	83	NIENHAUS et al., Direct Detection of Electron-Hole Pairs Generated by Chemical Reactions on Metal Surfaces, Surface Science 445, pp. 335-342 (2000)	-
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ADD	85	NOLAN et al., Translational Energy selection of Molecular Precursors to Oxygen Adsorption on Pt(111), Physical Review Letters, Vol. 81, No. 15 (1998)	-
ADD	86	NIENHAUS et al., Selective H Atom Sensors Using Ultrathin Ag/Si Schottky Diodes, Applied Physics Letters, Vol. 74, No. 26 (1999)	-
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ADD	88	NOLAN et al., Direct Verification of a High-Translational-Energy Molecular Precursor to Oxygen Dissociation on Pd(111), Surface Science 419 (1998)	-
ADD	89	OGAWA et al., Optical Intersubband Transitions and Femtosecond Dynamics in Ag/Fe(100) Quantum Wells, Physical Review Letters, Vol. 88, No. 11 (2002)	-

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ADD	90	PLIHAL et al., Role of Intra-Adsorbate Coulomb Correlations in Energy Transfer at Metal Surfaces, Physical Review B, Vol. 58, No. 4 (1998)	
ADD	91	PAGGEL et al., Quantum-Well States as Fabry-Perot Modes in a Thin-Film Electron Interferometer, Science, Vol. 283 (1999)	
ADD	92	PAGGEL et al., Quasiparticle Lifetime in Macroscopically Uniform Ag/Fe(100) Quantum Wells, Physical Review Letters, Vol. 81, No. 25 (1998)	
ADD	93	PAGGEL et al., Quantum Well Photoemission from Atomically Uniform Ag Films: Determination of Electronic Band Structure and Quasi-Particle Lifetime in Ag(100) Applied Surface Science 162-163, pp. 78-85 (2000)	
ADD	94	PERSSON et al., A First-Principles Potential Energy Surface for Eley-Rideal Reaction Dynamics of H Atoms on Cu(111), Journal of Chemical Physics, Vol. 110, No. 4 (1999)	
ADD	95	OZGUR et al., Control of Coherent Acoustic Phonons in InGaN Multiple Quantum Wells, arXiv:cond-mat/0010170 (2000)	
ADD	96	STANTON et al., Energy Relaxation by Hot Electrons in n-GaN Epilayers, Journal of Applied Physics, Vol. 89, No. 2 (2001)	
ADD	97	STIPE et al., Atomistic Studies of O2 Dissociation on Pt(111) Induced by Photons, Electrons and by Heating, J. Chem. Phys. 107 (16) (1997)	
ADD	98	SUN et al., Phonon Pumped SiGe/Si Interminiband Terahertz Laser, pp. 1-11 (Date Unknown).	
ADD	99	SOREF et al., Terahertz Gain in a SiGe/Si Quantum Staircase Utilizing the Heavy-Hole Inverted Effective Mass, Applied Physics Letters, Vol. 79, No. 22 (2001)	
ADD	100	QU et al., Long-Lived Phonons, Physical Review B, Vol. 48, No. 9 (1993)	

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Application Number	09/682,363
Filing Date	8/24/2001
First Named Inventor	Anthony C. Zuppero
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-6

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ADD	101	PONTIUS, et al., Size-Dependent Hot-Electron Dynamics in Small Pdn-Clusters, Journal of Chemical Physics, Vol. 115, No. 22 (2001)	-
ADD	102	SMIT et al., Enhanced Tunneling Across Nanometer-Scale Metal-Semiconductor Interfaces, Applied Physics Letters, Vol. 80, No. 14 (2002)	-
ADD	103	QIU et al., Long-Distance and Damping of Low-Frequency Phonon Polariton in LiNbO3, Physical Review B, Vol. 56, No. 10 (1997)	-
ADD	104	ROUSSE et al., Non-Thermal Melting in Semiconductors Measured at Femtosecond Resolution, Nature, Vol. 410 (2001)	-
ADD	105	SCHELLING et al., Phonon Wave-Packet Dynamics at Semiconductor Interfaces by Molecular-Dynamics Simulation, Applied Physics Letters, Vol. 80, No. 14 (2002)	-
ADD	106	SHIKIN et al., Phase Accumulation Model Analysis of Quantum Well Resonances Formed in Ultra-Thin Ag, Au Films on W(110), Surface Science (2001)	-
ADD	107	SNOW et al., Ultrathin PtSi Layers Patterned by Scanned Probe Lithography, Applied Physics Letters, Vol. 79, No. 8 (2001)	-
ADD	108	PRABHU et al., Femtosecond Energy Relaxation of Nonthermal Electrons Injected in p-doped GaAs Base of a Heterojunction Bipolar Transistor, Journal of Applied Physics, Vol. 90, No. 1 (2001)	-
ADD	109	TSAI et al., Theoretical Modeling of Nonequilibrium Optical Phonons and Electron Energy Relaxation in GaN, Journal of Applied Physics, Vol. 85, No. 3 (1999)	-
ADD	110	TRIPA et al., Surface-Aligned Photochemistry: Aiming Reactive Oxygen Atoms Along a Single Crystal Surface, Journal of Chemical Physics, Vol. 112, No. 5 (2000)	-
ADD	111	TRIPA et al., Surface-Aligned Reaction of Photogenerated Oxygen Atoms with Carbon Monoxide Targets, Nature, Vol. 398 (1999)	-

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Attorney Docket Number	22122878-6

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ADD	113	TAYLOR et al., Strong Electron-LO Phonon Scattering and Hot Carrier Relaxation in GaN, Abstract No. ba249KW3 (Date Unknown)	-
ADD	114	SUN et al., Phonon-Pumped Terahertz Gain in n-Type GaAs/AlGaAs Superlattices, Applied Physics Letters, Vol. 78, No. 22 (2001)	-
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ADD	116	TIUSAN et al., Quantum Coherent Transport Versus Diode-Like Effect in Semiconductor-Free Metal/Insulator Structure, Applied Physics Letters, Vol. 79, No. 25 (2001)	-
ADD	117	STROMQUIST et al., The Dynamics of H Absorption in and Adsorption on Cu(111), Surface Science 397, pp. 382-394 (1998)	-
ADD	118	TRIPA et al., Surface-Aligned Photochemistry: Aliming Reactive Oxygen Atoms Along a Single Crystal Surface, Journal of Chemical Physics, Vol. 112, No. 5 (2000)	-
ADD	119	TSAI et al., Theoretical Modeling of Nonequilibrium Optical Phonons and Electron Energy Relaxation in GaN, Journal of Applied Physics, Vol. 85, No. 3 (1999)	-
ADD	120	WEBER et al., Carrier Capture Processes in GaAs-AlGaAs Quantum Wells Due to Emission of Confined Phonons, Appl. Phys. Lett. 63 (22) (1993)	-
ADD	121	WINTERLIN et al., Atomic and Macroscopic Reaction Rates of a Surface-Catalyzed Reaction, Science, Vol. 278 (1997)	-
ADD	122	YEO et al., Calorimetric HEats for CO and Oxygen Adsorption and for the Catalytic CO Oxidation Reaction on Pt(111), J. Chem. Phys. 106 (1) (1997)	-

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	124	VALDEN et al., Onset of Catalytic Activity of Gold Clusters on Titania with The Appearance of Nonmetallic Properties, Science, Vol. 281 (1998)	-
	125	XU et al., Electrical Generation of Terahertz Electromagnetic Pulses by Hot-Electrons in Quantum Wells, Superlattices and Microstructures, Vol. 22, No. 1 (1997)	-
	126	WANKE et al., Injectorless Quantum-Cascade Lasers, Applied Physics Letters, Vol. 78, No. 25 (2001)	-
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		Filing Date	8/24/2001
		First Named Inventor	Anthony C. Zupparo
		Art Unit	1753
		Examiner Name	Alan D. Diamond
Sheet <input type="checkbox"/> of <input type="checkbox"/>	Attorney Docket Number	22122878-6	

OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS			
Examiner Initials ¹	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	Y ²
ADD	145	RYH et al., Methanol Oxidation of Palladium Compared to Rhodium at Ambient Pressures as Probed by Surface-Enhanced Raman and Mass Spectroscopies, <i>Journal of Catalysis</i> , Vol. 174 (2) (1998)	-
	146	GUMHALTER et al., Effect of Electronic Relaxation on Covalent Adsorption Reaction Rates, <i>Physical Review B</i> , Vol. 30, Issue 6 (1984)	-
	147	NOLAN et al., Surface Science, Direct Verification of a High-Translational-Energy Molecular Precursor to Oxygen Dissociation on Pd(111), <i>Surface Science</i> , Vol. 419 (1998)	-
	148	PHIHAL et al., Role of Intra-Adsorbate Coulomb Correlations in Energy Transfer at Metal Surfaces, <i>Physical Review B</i> , Vol. 58, Issue 4 (1998)	-
	149	TULLY et al., Electronic and Phonon Mechanisms of vibrational Relaxation: CO on Cu(100), <i>J. Vac. Sci. Technol. A</i> 11(4) (1993)	-
	150	DIMATTEO et al., Enhanced Photogeneration of Carriers in a Semiconductor Via Coupling Across a Nonisothermal Nonascale Vacuum Gap, <i>Applied Physics Letters</i> , Vol. 79, Issue 12 (2001)	-
	151	TRIPA et al., Surface-Aligned Photochemistry: Aliming Reactive Oxygen Atoms Along a Single Crystal Surface, <i>The Journal of Chemical Physics</i> , Vol. 112, Issue 5 (2000)	-
	152	YATES et al., Special Adsorption and Reaction Effects at Step Defect Sites on Platinum Single Crystal Surfaces (2000)	-
ADD	153	DEKORSY et al., Coherent Acoustic Phonons in Semiconductor Superlattices, <i>phys. stat. sp.</i> ; (b) 215, p 425-430 (1999)	-

Examiner Signature	<i>Alan D. Diamond</i>	Date Considered	1/18/05
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²Applicant's unique citation designation number (optional). ³Applicant is to place a check mark here if English language Translation is attached.

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Application Number	09/682,363
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Filing Date	8/24/2001
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First Named Inventor	Anthony C. Zuppero
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Art Unit	1753
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Examiner Name	Alan D. Diamond
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Attorney Docket Number	22122878-6
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U.S. PATENT DOCUMENTS

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FOREIGN PATENT DOCUMENTS

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Alan Smith

Date Considered

1/18/05

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**INFORMATION DISCLOSURE
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Application Number	09/682,363
Filing Date	8/24/2001
First Named Inventor	Anthony C. Zuppero
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-6

OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS

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ADD	7	AUERBACH, Daniel J.; "Hitting the Surface-Softly"; Science, 294, (2001), pp. 2488-2489	-
	8	BONDZIE, V. A., et al.; "Oxygen adsorption ... gold particles ... TiO ₂ (110)"; J. Vac. Sci. Tech. A., (1999) 17, pp. 1717 and figure 3	-
	9	BOULTER, James; "Laboratory Measurement of OH ..."; http://pearl.lanl.gov/wsa2002/WSA2002talks.pdf (Date Unknown)	-
	10	CHAN H.Y.H., et al.; "Methanol Oxidation On Palladium Compared To Rhodium..."; J. Catalysis v. 174(#2) pp. 191-200 (1998) (abstract and figure 1 only)	-
	11	CHIANG, T.-C.; "Photoemission studies of quantum well states in thin films; Surf. Sci. Rpts.39 (2000) pp 181-235	-
	12	CHUBB, D. L., et al; "Semiconductor Silicon as a Selective Emitter"; http://www.thermopv.org/TPVS-2-05-Chubb.pdf (abstract only) (Date Unknown)	-
	13	CORCELLI, S. A., et al.; "Vibrational energy pooling in CO on NaCl(100) ..."; J. Chem. Phys.(2002) 116, pp. 8079-8092	-
	14	DANESE, A., et al.; "Influence of the substrate electronic structure on metallic quantum well ..."; Prog. Surf. Sci., 67, (2001), pp 249-258	-
ADD	15	DAVIS, J. B., et al.; "Kinetics and dynamics of the dissociative chemisorption of oxygen on Ir(111)"; J. Chem. Phys. 107 (3), (1997), pp 943-952	-

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**INFORMATION DISCLOSURE
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Sheet

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Application Number	09/682,363
Filing Date	8/24/2001
First Named Inventor	Anthony C. Zuppero
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-6

OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS

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ADD	16	DIEKHONER, L., et al.; "Parallel pathways in methanol... Pt(111)"; Surf. Sci. 409 (1998) pp 384-391	-
	17	DIESING, D., et al.; "Aluminum oxide tunnel junctions..."; Thin Solid Films, Vol. 342 (1-2) (1999) pp. 282-290	-
	18	DIMATTEO, R. S., et al.; "Enhanced photogeneration of carriers... vacuum gap"; Appl. Phys. Lett. (2001) 79, pp. 1894-1896	-
	19	DIMATTEO, R. S., et al.; "Introduction to and Experimental Demonstration of Micron-gap ThermoPhotoVoltaics"; http://www.thermopv.org/37DiMatteo.html (abstract only) (Date Unknown)	-
	20	DOGWILER, Urs, et al.; "Two-dimensional ... catalytically stabilized ... lean methane-air ..."; Combustion and Flame, (1999), 116(1,2), pp 243-258	-
	21	ECHENIQUE, P. M., et al.; "Surface-state electron dynamics in noble metals"; Prog. Surf. Sci., 67, (2001), pp 271-283	-
	22	ENDO, Makoto, et al.; "Oxidation of methanol ... on Pt(111) ..."; Surf. Sci. 441 (1999) L931-L937, Surf. Sci. Letters	-
	23	FAN, C. Y., et al.; "The oxidation of CO on RuO2 ..."; J. Chem. Phys. 114, (2001), pp. 10058-10062	-
ADD	24	FANN, W.S., et al.; "Electron thermalization in gold"; Phys. Rev. B (1992) 46 pp. 13592-13595	-

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Substitute for form 1449/PTO		Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use as many sheets as necessary)		Application Number	09/682,363
		Filing Date	8/24/2001
		First Named Inventor	Anthony C. Zuppero
		Art Unit	1753
		Examiner Name	Alan D. Diamond
Sheet	of	Attorney Docket Number	22122878-6

OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS			
Examiner Initials	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	T ²
AD	25	GER, Adam T., et al.; "The dynamics of O2 adsorption on Pt(533)..."; J. Chem. Phys.(2000) 113, pp. 10333-10343	-
	26	GERGEN, Brian, et al.; "Chemically Induced Electronic Excitations at Metal Surfaces"; Science, 294, (2001) pp. 2521-2523	-
	27	GULIANTS, Elena A., et al.; "A 0.5-μm-thick polycrystalline silicon Schottky..."; Appl. Phys. Lett., (2002), 80, pp. 1474-1476	-
	28	GUMHALTER, B., et al.; "Effect of electronic relaxation ... adsorption reaction rates"; Phys. Rev. B (1984) 30 pp. 3179-3190	-
	29	HALONEN, Lauri, et al.; "Reactivity of vibrationally excited methane on nickel..."; J. Chem. Phys.(2001) 115, pp. 5611-5619	-
	30	HASEGAWA, Y., et al.; "Modification of electron ... standing wave ... Pd ...; Surf. Sci., in press, 11 April 2002	-
	31	HENRY, Claude R.; "Catalytic activity ... nanometer-sized metal clusters"; Applied Surf. Sci., 164, (2000) pp 252-259	-
	32	HESS, S., et al.; "Hot Carrier Relaxation ... Phonon Scattering in GaN"; http://www.physics.ox.ac.uk/rtaylor/images/hot%20carrier%20poster.pdf (Date Unknown)	-
AD	33	HO, Wilson; http://www.lasp.cornell.edu/lasp_data/wilsonho.html (Date Unknown)	-

Examiner Signature		Date Considered	1/18/05
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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**

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Complete if Known

Application Number	09/682,363
Filing Date	8/24/2001
First Named Inventor	Anthony C. Zuppero
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-6

Sheet 1 of 1**OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS**

Examiner Initials	Cite No. 1	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume- issue number(s), publisher, city and/or country where published	Y ²
AD	34	HOHLFELD, J. et al.; "Electron and lattice dynamics ... optical excitation of metals"; Chemical Physics, 251 (2000) pp 237-258	-
	35	HONKALA, Karolína, et al.; "Ab initio study of O2 precursor states on the Pd(111)..."; J. Chem. Phys. (2001) 115, pp. 2297-2302	-
	36	HOU, H.; Y., et al.; "Chemical Interactions of Super-Excited Molecules on Metal Surfaces"; http://www2.chem.ucsb.edu/~wodike/papers/danl.pdf (Date Unknown)	-
	37	HOU, H., et al.; "Direct multiquantum relaxation of highly vibrationally excited NO ..."; J. Chem. Phys., 110, (1999) pp 10660 - 10663	-
	38	HUANG Y., et al.; "Observation of Vibrational Excitation and Deexcitation for NO from Au(111) ..."; Phys. Rev. Lett., 84, (2000) pp 2985 - 2988	-
	39	HUANG, Yuhui, et al.; "Vibrational Promotion of Electron Transfer"; SCIENCE, VOL 290, 6 OCTOBER 2000, pp 111 - 113	-
	40	IBH; "NanoLED overview"; http://www.ibh.co.uk/products/light_sources/nanoled_ruain.htm (Date Unknown)	-
	41	IBH; "Red picosecond laser sources"; http://www.ibh.co.uk/products/light_sources/nanoled/heads/red_laser_heads.htm (Date Unknown)	-
AD	42	IFTIMIA, Ilana, et al.; "Theory ... scattering of molecules from surface"; Phys. Rev. B (2002) 65, Article 125401	-

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Sheet 1 of 1**Complete if Known**

Application Number	09/682,363
Filing Date	8/24/2001
First Named Inventor	Anthony C. Zuppero
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OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS

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ADD	43	ISHIKAWA, Yasuyuki, et al.; "Energetics of H ₂ O dissociation and COads+OHads reaction .. Pt."; Surf. Sci. preprints SUSC 12830, 27 April 2002	-
	44	JOHNSON, R. Collin; "Molecular substitution ...terahertz switch arrays"; EE Times, (04/10/00, 3:35 p.m. EST) http://www.eet.com/story/OEG20000410S0057	-
	45	KAO, Chia-Ling, et al.; "The adsorption ... molecular carbon dioxide on Pt(111) and Pd(111)"; Surf. Sci., (2001) Article 12570	-
	46	KATZ, Gil, et al.; "Non-Adiabatic Charge Transfer Process of Oxygen on metal Surfaces"; Surf. Sci. 423(1) (1999) pp. 1-14	-
	47	KAWAKAMI, R. K., et al.; "Quantum-well states in copper thin films"; Nature, 398, (1999) pp 132 - 134	-
	48	KOMEDA, T., et al.; "Lateral Hopping of Molecules Induced by Excitation of Internal Vibration..."; Science, 295, (2002) pp 2055-2058	-
	49	LEWIS, Steven P., et al.; "Continuum Elastic Theory of Adsorbate Vibrational Relaxation"; J. Chem. Phys. 108, 1157 (1998)	-
	50	LEWIS, Steven P., et al.; "Substrate-adsorbate coupling in CO-adsorbed copper"; Phys. Rev. Lett. 77, 5241 (1996)	-
ADD	51	LI, Shenping, et al.; "Generation of wavelength-tunable single-mode picosecond pulses ..."; Appl. Phys. Lett. 76, (2000) pp 3676 - 3678	-

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		Filing Date	8/24/2001
		First Named Inventor	Anthony C. Zuppero
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		Examiner Name	Alan D. Diamond
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OTHER PRIOR ART -- NON PATENT LITERATURE DOCUMENTS			
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ADD	52	MITSU, T., et al.; "Coadsorption and Interactions of O and H on Pd(111)"; Surf. Sci., Article 12767, (2002)	-
	53	MOULA, Md. Golam, et al.; "Velocity distribution of desorbing CO ₂ in CO oxidation on Pd(110)..."; Applied Surf. Sci., 169-170, pp 268-272 (2001)	-
	54	MULET, Jean-Philippe, et al.; "Nanoscale radiative heat transfer between a small particle ..."; Appl. Phys. Lett., 78, (2001) p 2931	-
	55	NIENHAUS, H., et al.; "Direct detection of electron-hole pairs generated by chemical reactions on metal surfaces"; Surf. Sci. 445 (2000) pp 335-342	-
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	57	NIENHAUS, H., et al.; "Selective H atom sensors using ultrathin Ag/Si Schottky diodes"; Appl. Phys. Lett. (1999) 74, pp. 4046-4048	-
	58	NIENHAUS, Hermann; "Electron-hole pair creation by reactions at metal surfaces"; APS, March 20-26, 1999, Atlanta, GA, Session SC33 [SC33.01]	-
	59	NIENHAUS, H., et al.; "Electron-Hole Pair Creation at Ag and Cu ... of Atomic Hydrogen and Deuterium"; Phys. Rev. Lett., 82, (1999) pp. 446-449	-
ADD	60	NOLAN P. D., et al.; "Direct verification of... precursor to oxygen dissociation on Pd(111)"; Surf. Sci. v. 419(#1) pp. L107-L113, (1998)	-

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First Named Inventor	Anthony C. Zupparo
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Sheet 1 of 1**OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS**

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ADD	61	NOLAN, P. D., et al.; "Molecularly chemisorbed intermediates to oxygen adsorption on Pt..."; J. Chem. Phys. 111, (1999), pp 3696 - 3704	-
	62	NOLAN, P. D., et al.; "Translational ... Precursors to Oxygen Adsorption on Pt(111)"; Phys. Rev. Lett., 81, (1998) pp 3179 - 3182	-
	63	OGAWA, S., et al.; "Optical ... and Femtosecond Dynamics in Ag/Fe(100) Quantum Wells"; Phys. Rev. Lett. 88, 116801 (2002)	-
	64	PAGGEL, J. J., et al.; "Quantum-Well States as Fabry-Pérot Modes in a ..."; Science, 283, (1999), pp 1709 - 1711	-
	65	PAGGEL, J. J., et al.; "Quasiparticle Lifetime ... Ag/Fe(100) Quantum Wells"; Phys. Rev. Lett. (1998) 81, pp. 5632-5635	-
	66	PAGGEL, J.J., et al.; "Quantum well photoemission from atomically uniform Ag films ..."; Applied Surf. Sci., 162 - 163, (2000), pp 78 - 85	-
	67	RETTNER, C. T., et al; "Dynamics ... chemisorption of O2 on Pt(111)... chemisorbed precursor..."; J. Chem. Phys. (1991) 94, pp. 1626-1635 (abstract only)	-
	68	RINNEMO, Mats; "Catalytic Ignition and Kinetic Phase Transitions"; 1996; http://www2.lib.chalmers.se/ctb/diss/doc/9596/RinnemoMats.html	-
ADD	69	ROBERTSON, A. J. B.; "Catalysis of Gas Reactions by Metals"; Logos Press Limited; 1970; LC # 70-80936; pp. 1-5, 10, 41; Great Britain, Adlard & son Ltd	-

Examiner Signature	<i>Alan D. Diamond</i>	Date Considered	1/18/05
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Application Number	09/682,363
Filing Date	8/24/2001
First Named Inventor	Anthony C. Zuppero
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-6

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ADD	70	SCHWEIB, P., et al.; "CO2 Production at the Single-Molecule Level"; http://www.aip.org/cnews/physnews/2001/split/361-1.html (2001)	-
	71	SHENG, H., et al.; "Schottky diode with Ag on (110) epitaxial ZnO film"; Appl. Phys. Let. (2002) 80, pp. 2132-2134	-
	72	SMIT, G. D. J., et al.; "Enhanced tunneling across nanometer-scale metal-semiconductor interfaces"; Appl. Phys. Let. (2002) 80, pp. 2568-2570	-
	73	SNOW, B. S., et al.; "Ultrathin PtSi layers patterned by scanned probe lithography"; Appl. Phys. Let. (2001) 79, pp. 1109-1111	-
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	75	SUN, C.-K., et al.; "Femtosecond studies of carrier dynamics in InGaN"; Appl. Phys. Let. (1997) 70 pp. 2004-2006	-
	76	SVENSSON, K., et al.; "Dipole Active Vibrational Motion in the Physisorption Well"; Phys. Rev. Lett., 78, (1997) pp 2016-2019	-
	77	TARVER, Craig M.; "Non-Equilibrium Chemical Kinetic ... Explosive Reactive Flows"; Fall 1999 IMA Workshop: High-Speed Combustion in Gaseous and Condensed-Phase	-
ADD	78	TAYLOR, R.A., et al.; "Strong Electron-LO Phonon Scattering and Hot Carrier Relaxation in GaN"; http://www.physics.ox.ac.uk/rtaylor/images/ha249kw3.pdf (Date Unknown)	-

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ADD	79	TEODORESCU, C.M., et al.; "Structure of Fe layers grown on InAs ..."; Appl. Surf. Sci., 166, (2000) pp 137-142	-
	80	TIUSAN, C., et al.; "Quantum coherent transport versus diode-like effect in ..."; Appl. Phys. Lett. 79, (2001) pp 4231-4233	-
	81	TRIPA, C. Emil, et al.; "Surface-aligned photochemistry: Aiming reactive oxygen atoms ..."; J. Chem. Phys., (2000) 112 pp. 2463-2469	-
	82	TRIPA, C. Emil, et al.; "Surface-aligned reaction of photogenerated oxygen atoms with ..."; Nature 398, pp 591 - 593 (1999)	-
	83	TRIPA, C. Emil; "Special Adsorption and Reaction Effects at Step Defect Sites on Platinum ..."; http://www.chem.pitt.edu/thesis.html#tripa (abstract only) (Date Unknown).	-
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	85	WATSON, D.T.P., et al.; "Isothermal and temperature-programmed oxidation of CH over Pt..."; Surf. Sci. preprint, year 2001	-
ADD	86	WATSON, D.T.P., et al.; "Surface products of the dissociative adsorption of methane on Pt ..."; Surf. Sci. preprint, c. October 2001	-

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		First Named Inventor	Anthony C. Zuppero
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AD	87	WILKE, Steffen, et al.; "Theoretical investigation of water formation on Rh and Pt Surfaces"; J. Chem. Phys., 112, (2000) PP 9985 - 9995	-
AD	88	WINTERLIN, J, et al; "Atomic ...Reaction Rates ... Surface-Catalyzed ..."; Science, 278, (1997) pp. 1931 - 1934	-
AD	89	WINTERLIN, J, R., et al.; "Existence of a "Hot" Atom Mechanism for the Dissociation of O2 on Pt(111)"; Phys. Rev. Lett., 77, (1996), pp 123 - 126	-
AD	90	ZAMBELLI, T., et al.; "Complex pathways in dissociative adsorption of oxygen on platinum"; Nature 390, pp 495 - 497 (1997)	-
AD	91	ZHDANOV, V.P., et al.; "Substrate-mediated photoinduced chemical reactions on ultrathin metal films"; Surf. Sci., V. 432 (#3) pp L599-L603, (1999)	-
AD	92	ZHDANOV, Vladimir P.; "Nm-sized metal particles on a semiconductor surface, Schottky ..."; Surf. Sci. PROOF SUSG 2931, 20 April 2002	-
AD	93	ZHUKOV, V. P., et al.; "Lifetimes of quasiparticle excitations in 4d transition metals ..."; Phys. Rev. B (2002) 65, Article 115116	-

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ADD	1	DANIEL J. AUERBACH, Hitting the Surface Softly, www.sciencemag.org, Vol 294 Science, December 21, 2001, pp. 2488-2489.	
	2	M.D CUMMINGS AND A.Y ELE' ZZABI, Ultrafast impulsive excitation of coherent longitudinal acoustic phonon oscillations in highly photoexcited InSb, 2001 American Institute of Physics, Volume 79, Number 6, August 6, 2001.	
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	4	BRIAN GERGEN, HERMAN NIENHAUS, W. HENRY WEINBERG, ERIC W. McFARLAND, Chemically Induced Electronic Excitations at Metal Surfaces, www.sciencemag.org, Vol 294, December 21, 2001, Pgs 2521-2523.	
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	7	STEVEN p. LEWIS, ANDREW M. RAPPB, Controlling adsorbate vibrational lifetimes using superlattices, 2001 The American Physical Society, Physical Review B, Volume 63, 085402.	
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ADD	11	FRIEDMAN, L., SUN G., SOROFF, R.A.; SiGe/Si THz laser based on transitions between inverted mass light-hole and heavy-hole subbands; Applied Physics Letters, Volume 78, Number 4, 22 January 2001; Pg: 401-403.	

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Application Number	09/682,363
Filing Date	8/24/2001
First Named Inventor	Anthony C. Zuppero
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-6

Sheet 1 of 1

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ADD	12	HARRISON, P., SOREF, R.A.; Population-inversion and gain estimates for semiconductor TASER. (Date Unknown)	—
	13	HARRISON, P., SOREF, R.A.; Room temperature population inversion in SiGe TASER design. (Date Unknown)	—
	14	HOHLFELD, J., WELLERSHOFF, S.-S. J., GUDDE, U., CONRAD, V., JAHNKE, B., MATTIAS; Electron and lattice dynamics following optical excitation of metals; Chemical Physics 251(2000), Pp: 237-258.	—
	15	HOU, H., HUANG, Y., GOULDING, S.J., RETTER, C.T., AUERBACH, D.J., WODRKE, A.M.; Direct multiquantum relaxation of highly vibrationally excited NO in collisions with O/Cu(111);	—
	16	JONGMA, RIENK T., WODTKE, ALEC M.; Fast multiquantum vibrational relaxation of highly vibrationally excited O ₂ ; Journal of Chemical Physics; Volume 111, Number 24; 22 December 1999; Pgs: 10957-10963.	—
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ADD	19	JEAN-PHILIPPE MULET, KARL JOULAIN, REMI CARMINATI, AND JEAN- JACQUES GREFFET; Nanoscale radiative heat transfer between a small particle and a plane surface; Applied Physics Letters; Volume 78, Number 19; 7 May 2001; Pgs: 2931-2933.	—

Journal of
Chemical Physics
Vol. 110 (22)
P. 10660, (1999)

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ADD	20	H. NIEHAUS et al., "Direct detection of electron-hole pairs generated by chemical reaction on metal surfaces", Surface Science 445 (2000), Pages 3350342.	-
ADD	21	H. NIEHAUS et al., "Selective H atom sensors using ultrathin Ag/Si Schottky diodes", Applied Physics Letters, Volume 74, Number 26, 28 June 1999, Pages 4046-4048.	-
ADD	22	JJ PAGGEL et al., "Quantum-Well States as a Fabry-Perot Modes in a Thin-Film Electron Interferometer", www.Sciencemag.org Science Vol 284 12 March 1999, Pages 1709-1711.	-
ADD	23	JJ PAGGEL et al., "Quasiparticle Lifetime in Macroscopically Uniform Ag/Fe(100) Quantum Wells", Physical Review Letters, Volume 81, Number 25, 21 December 1998, Pages 5632-5635.	-
ADD	24	JJ PAGGEL et al., "Quantum well photoemission from atomically uniform Ag films: determination of electronic band structure and quasi particle lifetime in Ag(100), Applied Surface Science 162-163(2000), Pages 78-85.	-
ADD	25	N. PONTIUS et al., "Size-dependent hot-electron dynamics in small Pd _n -cluster", Journal of Chemical Physics, Volume 115, Number 22, 8 December 2001, Pages 10479-10483.	-
ADD	26	R.A. SOREL et al., "Terahertz gain in a SiGe/Si quantum staircase utilizing the heavy-hole inverted effective mass, Applied Physics Letters, Volume 79, Number 22, 26 November 2001, Pages 3639-3641.	-

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ADD	27	G. SUN et al., "Phonon-pumped terahertz gain in n-type GaAs/AlGaAs Superlattices, Applied Physics Letters, Volume 78, Number 22, Pages 3520-3522, May 28, 2001.	-
	28	V. P. ZHDANOV et al., "Substrate-mediated photoinduced chemical reactions on ultrathin metal films", Surface Science 432 (1999), Pages L599-L603.	-
	29	H. PARK et al., "Nanomechanical oscillations in a single-C60 transistor", Letters to nature, Volume 407, September 7, 2000, www.nature.com, Pages 57-60.	-
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	32	K. SVENSSON et al., "Dipole Active Vibrational Motion in the Physisorption Well", Physical Review Letters, Volume 78, Number 10, 10 March 1997, Pages 2016-2019.	-
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AD	36	P. ARMOUR et al., "Hot-electron transmission through metal-metal interfaces: a study of Au/Fe/Au trilayers in GaAs substrates", Applied Surface Science 123/124 (1998), Pages 412-417.	-
	37	C.D. BEZANT et al., "Intersubband relaxation lifetimes in p-GaAs/AlGaAs quantum wells below the LO-phonon energy measured in a free electron laser experiment", Vacuum Solutions Online, Semicond. Sci. Technol. 14 No. 8 (August 1999) L25-L28, PI: S0268-1242(99)03669-X.	-
	38	L. BURGI et al., "Confinement of Surface State Electrons in Fabry-Perot Resonators", Physical Review Letters, Volume 81, Number 24, 14 December 1998, Pages 5370-5373.	-
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	41	DE PAULA, A. et al, "Carrier capture processes in semiconductor superlattices due to emission of confined phonons", J. Appl. Phys. 77 (12), 1995 pp 6306-6312.	-

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Sheet

of

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Application Number	09/682,363
Filing Date	8/24/2001
First Named Inventor	Anthony C. Zuppero
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-6

U. S. PATENT DOCUMENTS					
Examiner Initials*	Cite No. ¹	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code ^{2 (if known)}			
ADD	A	US-4045359	08-1977	Fletcher et al.	
ADD	B	US-4407705	10-1983	Garscadden et al.	
ADD	C	US-5932885	08-1999	DeBellis et al.	
ADD	D	US-6114620	09-2000	Zuppero et al.	
ADD	E	US-6218608-B1	04-2001	Zuppero et al.	
ADD	F	US-6222116-B1	04-2001	Zuppero et al.	
ADD	G	US-6268560-B1	07-2001	Zuppero et al.	
ADD	H	US-2001/0018923-A1	09-2001	Zuppero et al.	
ADD	I	US-6327859-B1	12-2001	Zuppero et al.	
ADD	J	US-2002/0017827-A1	02-2002	Zuppero et al.	
ADD	K	US-2002/0121088-A1	08-2002	Zuppero et al.	
ADD	L	US-2002/0196825-A1	12-2002	Zuppero et al.	

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**INFORMATION DISCLOSURE
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Sheet 1 of 1

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Application Number	09/682,363
Filing Date	8/24/2001
First Named Inventor	Anthony C. Zuppero
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-6

OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS			
Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume/issue number(s), publisher, city and/or country where published.	
ADD	1	REE, J. et al., "Dynamics of Gas-Surface Interactions: Reaction of Atomic Oxygen with Chemisorbed Hydrogen on TUNGSTEN," Journal of Physical Chemistry, Vol. 101 (#25), pp. 4523 - 4534, June 19, 1997.	-
ADD	2	REE, J. et al., "Reaction of atomic oxygen with adsorbed carbon monoxide on a platinum surface," Journal of Chemical Physics, Vol. 104, Issue 2, pp. 742 - 757, January 8, 1996.	-
ADD	3	NOLAN, P.D. et al., "Molecularly chemisorbed intermediates to oxygen adsorption on Pt(111): A molecular beam and electron energy-loss spectroscopy study," Journal of Chemical Physics, Vol. 111, No. 8, pp. 3696 - 3704, August 22, 1999.	-
ADD	4	NOLAN, P. D. et al., "Translation Energy Selection of Molecular Precursors to Oxygen Adsorption on Pt (111)," Physical Review Letters, Vol. 81, No. 15, pp. 3179 - 3182, October 12, 1998.	-
ADD	5	MURPHY, M. J. et al., "Inverted vibrational distributions from N ₂ recombination at Ru(001): Evidence for a metastable molecular chemisorption well," Journal of Chemical Physics, Vol. 110, No. 14, pp. 6954 - 6962, April 8, 1999.	-
ADD	6	KIM, M. S. et al., "Reaction of Gas-Phase Atomic Hydrogen with Chemisorbed Hydrogen Atoms on an Iron Surface," Bull. Korean Chem. Soc., Vol. 18, No. 9, pp. 985 - 994, May 22, 1997.	-
ADD	7	BONN, M. et al., "Phonon-Versus Electron-Mediated Desorption and Oxidation of CO on Ru(0001)," Science, Vol. 285, pp. 1042 - 1045, August 13, 1999. www.sciencemag.org	-

Examiner Signature	<i>Alan D. Diamond</i>	Date Considered	1/18/05
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**INFORMATION DISCLOSURE
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Complete if Known

Application Number	09/682,363
Filing Date	8/24/2001
First Named Inventor	Anthony C. Zupparo
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-6

OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS			
Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
ADD	8	NOLAN, P. D. et al., "Direct verification of a high-translational-energy molecular precursor to oxygen dissociation on Pd(111)," <u>Surface Science Letters</u> , Vol. 419, pp. L107 - L113, September 24, 1998.	-
ADD	9	DAVIS, J. E. et al., "Kinetics and dynamics of the dissociative chemisorption of oxygen on Ir(111)," <u>Journal of Chem. Phys.</u> , Vol. 107(3), pp. 943 - 952, July 15, 1997.	-
ADD	10	TRIPA, C. Emil et al., "Surface-aligned reaction of photo-generated oxygen atoms with carbon monoxide targets," <u>Nature</u> , Vol. 398, pp. 591 - 593, April 15, 1999, www.nature.com .	-
ADD	11	SHIN HK, "Vibrationally excited OD Radicals from the Reaction of Oxygen-Atoms with Chemisorbed Deuterium on TUNGSTEN," <u>Journals of Physical Chemistry</u> , Vol. 102(#13), pp. 2372 - 2380, March 26, 1998.	-
ADD	12	TRIPA, C. Emil et al., "Kinetics measurements of CO photo-oxidation on Pt(111)," <u>Journal of Chemical Physics</u> , Vol. 105, Issue 4, pp. 1691 - 1696, July 22, 1996.	-

Examiner Signature		Date Considered	1/18/05
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Filing Date	8/24/2001
First Named Inventor	Anthony C. Zuppero
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-6

U.S. PATENT DOCUMENTS

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FOREIGN PATENT DOCUMENTS

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Application Number	09/682,363
Filing Date	8/24/2001
First Named Inventor	Anthony C. Zuppero
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-6

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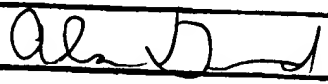
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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
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Sheet 1 of 1

Application Number	09/682,363
Filing Date	8/24/2001
First Named Inventor	Anthony C. Zuppers
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-6

OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS		
Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
AD	1.	FRESE, et al., "Analysis of Current/Voltage Curves at n-Si/SiO ₂ /Pt Electrodes", J. Electrochem. Soc., December 1994, pp. 3375-3382, Vol. 141, No. 12, The Electrochemical Society, Inc.
AD	2.	FRESE, et al., "Methanol Oxidation at p-Si/Pt Electrodes, Evidence for Hot Hole Reactivity", J. Phys. Chem., 1995, pp. 6074-6083, Vol. 99, American Chemical Society.
AD	3.	GADZUK, "Multiple Electron Processes in Hot-Electron Femtochemistry at Surfaces", http://www.csl.nist.gov/div837/837.03/highlite/gadzuk1999.htm .
AD	4.	FRESE, et al., "Hot Electron Reduction at Etched n-Si/Pt Thin Film Electrodes", J. Electrochem. Soc., September 1994, pp.2402-2409, Vol. 103, The Electrochemical Society Inc.
AD	5.	GAILLARD, et al., "Hot Electron Generation in Aqueous Solution at Oxide-Covered Tantalum Electrodes, Reduction of Methylpyridinium and Electrogenerated Chemiluminescence of Ru(bpy) ₃ ²⁺ ", J. Phys. Chem., 1999, pp.667-674, Vol. 103, American Chemical Society.
AD	6.	SUNG, et al., "Demonstration of Electrochemical Generation of Solution-Phase Hot Electrons at Oxide-Covered Tantalum Electrodes by Direct Electrogenerated Chemiluminescence", J. Phys. Chem., 1998, pp. 9797-9805, Vol. 102, American Chemical Society.
AD	7.	ZHDANOV, et al., "Substrate-mediated photoinduced chemical reactions on ultrathin metal films", Surface Science, 1999, pp. L599-L603, Vol. 432, Elsevier Science B.V.

Examiner Signature		Date Considered	1/18/05
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Substitute for form 1449/PTO		Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Use as many sheets as necessary)</i>		Application Number	09/682,363
		Filing Date	8/24/2001
		First Named Inventor	Anthony C. Zuppers
		Art Unit	1753
		Examiner Name	Alan D. Diamond
Sheet <input type="checkbox"/> of <input type="checkbox"/>	Attorney Docket Number	22122878-6	

OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS			
Examiner Initials ¹	Cite No. ²	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ³
AD	1	PRESE, K. W., Jr. et al., "Hot electron reduction at etched n-Si/Pt thin film electrodes," Journal of the Electrochemical Society, Vol. 141, No. 9, September 1994, pp. 2402 - 2409.	-
AD	2	MAHAN, G. D. et al., "Multilayer thermionic refrigerator and generator," Journal of Applied Physics, Vol. 83, No. 9, 1 May 1998.	-
AD	3	STIPE, B. C. et al., "Atomistic studies of O ₂ dissociation on Pt(111) induced by photons, electrons, and by heating," J. of Chem. Phys., Vol. 107 (16), October 22, 1997, pp. 6443 - 6447.	-
AD	4	TRIPA, C. E. et al., "Surface-aligned reaction of photogenerated oxygen atoms with carbon monoxide targets," Nature, Vol. 398, 15 April 1999, pp. 591 - 593.	-

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Sheet <input type="text"/> of <input type="text"/>		Attorney Docket Number	22122878-6

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ADD	1	BONN, M. et al., "Phonon-Versus Electron-Mediated Desorption and Oxidation of CO on Ru(0001)," Science, Vol. 285, No. 5430, Issue of 13 August 1999, pp. 1042-1045.	-
ADD	2	DAVIS, J. E. et al., "Kinetics and dynamics of the dissociative chemisorption of oxygen on Ir(111)," J. Chem. Phys., 107 No. 3, 15 July 1997, pp. 943-951.	-
ADD	3	GADZUK, J. W., "Hot-electron femtochemistry at surfaces: on the role of multiple electron processes in desorption," Chemical Physics, Vol. 251, year 2000, pp. 87-97.	-
ADD	4	GADZUK, J. W., "Resonance-assisted hot electron femtochemistry at surfaces," Physical Review Letters, May 27, 1996, Vol. 76, Issue 22, pp. 4234-4237.	-
ADD	5	GE, N.-H. et al., "Femtosecond Dynamics of Electron Localization at Interfaces," Science, Vol. 279, No. 5348, Issue of 9 Jan 1998, pp. 202-205.	-
ADD	6	GAO, Shiwu, "Quantum kinetic theory of vibrational heating and bond breaking by hot electrons," Physical Review B, Vol. 55, No. 3, 15 Jan 1997-I, pp. 1876-1886.	-
ADD	7	HOU, H. et al., "Enhanced Reactivity of Highly Vibrationally Excited Molecules on Metal Surfaces," Science, Vol. 284, No. 5420, Issue of 4 Jun 1999, pp. 1647-1650.	-
ADD	8	NIENHAUS, H. et al., "Direct detection of electron hole pairs generated by chemical reactions on metal surfaces," Surface Science 445 (2000) pp. 335-342.	-
ADD	9	NIENHAUS, H. et al., "Selective H atom sensors using ultrathin Ag/Si Schottky diodes," Applied Physics Letters, June 28, 1999, Vol. 74, Issue 26, pp. 4046-4048.	-
ADD	10	GAILLARD, Frederic et al., "Hot electron generation in aqueous solution at oxide-covered tantalum electrodes. Reduction of methylpyridinium and electrogenerated chemiluminescence of Ru(bpy)32+," Journal of Physical Chemistry B., Vol. 103, No. 4, January 28 1999, pp. 667-74.	-
ADD	11	ENGSTROM, Ulrika and RYBERG, Roger, "Comparing the vibrational properties of low-energy modes of a molecular and an atomic adsorbate: CO and O on Pt (111)," Journal Of Chemical Physics, Vol. 112, No. 4, 22 January 2000, pp. 1959-1965.	-

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		First Named Inventor	Anthony C. Zuppero		
		Art Unit	1753		
		Examiner Name	Alan D. Diamond		
Sheet	1	of	1	Attorney Docket Number	22122878-8

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ADD	14	OTTO, Andreas et al., "Role of atomic scale roughness in hot electron chemistry," Journal of Physical Chemistry B, Vol. 103, No. 14, April 8, 1999, pp. 2696-2701.	-
ADD	15	PLIHAL, M. et al., "Role of intra-adsorbate Coulomb correlations in energy transfer at metal surfaces," Physical Review B, Vol. 58, No. 4, July 15, 1998, pp. 2191-2206.	-
ADD	16	SUNG, Yung-Eun et al., "Enhancement of electrochemical hot electron injection into electrolyte solutions at oxide-covered tantalum electrodes by thin platinum films," Journal of Physical Chemistry B., Vol. 102, No. 49, December 3 1998, pp. 9806-11.	-
ADD	17	ZHDANOV, V. P. et al., "Substrate-mediated photoinduced chemical reactions on ultrathin metal films," Surface Science, Vol. 432 (#3), pp. L599-L603, July 20, 1999.	-
ADD	18	NIENHAUS, H., "Electron-hole pair creation by reactions at metal surfaces," American Physical Society, Centennial Meeting Program, March 20-26, 1999, Atlanta, GA, Session SC33 - Metal Surfaces: Adsorbates. http://www.aps.org/meet/CENT99/BAPS/	-
ADD	19	NIENHAUS, H et al., "Electron-Hole Pair Creation at Ag and Cu Surfaces by Adsorption of Atomic Hydrogen and Deuterium," Physical Review Letters, Vol. 82, Issue 2, January 11, 1999, pp. 446-449.	-

Examiner Signature		Date Considered	11/18/05
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† Unique citation designation number. * Applicant is to place a check mark here if English language Translation is attached.

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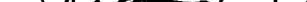
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		Application Number	09/682,363
		Filing Date	8/24/2001
		First Named Inventor	Anthony C. Zuppero
		Art Unit	1753
		Examiner Name	Alan D. Diamond
		Attorney Docket Number	22122878-6

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Examiner Signature		Date Considered	1/18/05
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Filing Date	8/24/2001
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First Named Inventor	Anthony C. Zuppero
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Art Unit	1753
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Examiner Name	Alan D. Diamond
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Attorney Docket Number	22122878-6
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OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS

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**Examiner
Signature**

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Date _____

Considered

1/18/05

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Sheet 1 of 1**Complete If Known**

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U. S. PATENT DOCUMENTS					
Examiner Initials*	Cite No. ¹	Document Number Number-Kind Code ² (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
ADD	A	US-6,537,829	03-2003	Zarling et al.	
ADD	EI	US-6,444,478	09-2002	Morgan, Christopher Grant	
ADD	C	US-6,399,397	06-2002	Zarling et al.	
ADD	E	US-6,312,914	11-2001	Kardos et al.	
ADD	G	US-6,251,887	06-2001	Buechler et al.	
ADD	H	US-6,238,931	05-2001	Buechler et al.	
ADD	K	US-6,159,886	12-2000	Kardos et al.	
ADD	M	US-5,891,656	04-1999	Zarling et al.	

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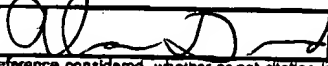
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ADD	A	US-2003/0207331	11-2003	Wilson et al.	1
ADD	B	US-2003/0166307	09-2003	Zuppero et al.	1
ADD	C	US-2003/0100119	05-2003	Weinberg et al.	1
ADD	D	US-2003/0030067	02-2003	Chen, Wei	1
ADD	E	US-2003/0019517	01-2003	McFarland, Erick W.	1
ADD	G	US-2002/0121088	09-2002	Zuppero et al.	1
ADD	H	US-2002/0070632	06-2002	Zuppero et al.	1
ADD	I	US-2002/0045190	04-2002	Wilson et al.	1
ADD	J	US-2002/0017827	02-2002	Zuppero et al.	1
ADD	L	US-6,700,056	03-2004	Zuppero et al.	1
ADD	1A	US-6,649,823	11-2003	Zuppero et al.	1

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Sheet 1 of 1

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		Number-Kind Code ² (if known)			
ADD	A	US-5,763,189	08-1998	Buechler et al.	—
ADD	B	US-5,736,410	04-1998	Zarling et al.	—
ADD	C	US-5,898,397	12-1997	Zarling et al.	—
ADD	D	US-5,674,698	10-1997	Zarling et al.	—
ADD	E	US-5,632,870	05-1997	Kucherov, Yan R.	—
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		Country Code ³ Number ⁴ Kind Code ⁵ (if known)			
ADD		WO 01/28677A1	04-2001	Zuppero et al.	—
ADD		JP-02157012A	06-1990	—	—

Examiner Signature	<u>Alan D. Diamond</u>	Date Considered	1/18/05
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